CGAPS "Box Exercise" Statewide Additional Needs Matrix

Resources that can be shared with other efforts appear in red text

Species: Summary of All **Category: N/A**

	#FTE's	FTE $	Funding	Subtotal
Prevention	144	$8,640,000	$820,000	$9,460,000
Early Detection	31.5	$1,890,000	$789,000	$2,679,000
Rapid Response	68.25	$4,095,000	$539,000	$4,634,000
Control	292	$17,520,000	$12,732,000	$30,252,000
Enforcement	6	$360,000	$410,000	$770,000
Public Outreach	50.25	$3,015,000	$1,787,000	$4,802,000
Totals	515	**$35,520,000**	$14,003,000	**$52,597,000**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

This Box Exercise was led by CGAPS Chair Duane Nelson (USFS) over the course of several months, starting in June, 2000. Focus groups of state, federal, and NGO invasive species experts participated in the discussions, using representative species or groups of species as discussion points for addressing gaps.

CGAPS "Box Exercise" Statewide Needs Matrix

Resources that can be shared with other efforts appear in *red italics.*

Species: Consolidated (Multi-species) Needs **Category:**

	Goals	Additional Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1]Improve the ablitiy of quarantine to intercept incoming invasive species	*1] Add 65 new PQ Quarantine officers and associated staff to provide 24 hour staffing at all ports-of-entry in the state 2] 10 commercial X-Ray machines @ $50K 3] 7 inspection dogs @ $10K 4) New inspectors with primary responsibility to prevent inter-island movement of banana bunchy-top (18 FTE's) and import of turf (lethal yellows)(9 FTE's) 5) One botanically trained inspector for each of three shfts at each port to intercept prohibited species (30 FTE's) 6)2 FTE's to screen plant species using a risk assesment process.7) Authority and staff for inspection of first class mail (6 FTE's) 8)"Greenseal" certification for all nurseries in compliance with BMP's (to be developed)*	130	$7,800,000	$570,000	$8,370,000
Early Detection	1] Establish baseline distribution and abundance data for state	*1] Establish county and statewide GIS/database (9 FTE's, $80K GIS) 2] Establish identification and voucher system with Bishop Museum ($25K/yr) 3] HDOA inspection of certified nurseries to include RIFA, herps and other priority invasive species (6 FTE's) 4] Establish Invasive Species Hotline for public reporting (same FTE's as database) 5]Remote sensing imagery for invasive species detection ($20,000)*	15	$900,000	$125,000	$1,025,000
Rapid Response	1] Respond to and eradicate all new populations of target species 2] Contain dense core populations of highest priority widespread species	*1] Big Island: 26 FTE for Miconia and other invasive species; Maui: 15 FTE for same; Oahu: 8 FTE for same; Molokai and Lanai: 3 FTE each for priority invasive species; Kauai: 8 FTE for same 2] Helicopter support: Big Island: 200 hr; Maui: 100 hr; Molokai and Lanai: 50 hr; Oahu: 100 hr; Kauai: 100 hr*	63	$3,780,000	$352,000	$4,132,000
Control	1] Coordinate and improve research on control, detection, management of invasive species 2] Develop and implement effective biocontrol agents for priority invasive species 3] control widely established pests in all native ecosystems in the state to prevent their further degradation 4 control widely established pests in all agro-ecosystems in the state.	*1] Create invasive species positions at Coop Unit for research/management liaison (2 FTE) 2] Build and staff $10M biocontrol facility * capital investment (25 FTE, $100K operating, $100K foreign exploration) 3]staffing for ongoing plant control (120 FTE's) 4] Staffing for ongoing predator control (10 FTE's) and helicopter time for bait applications (100 hours, 64,000) 5 Staffing for ongoing pest control in agro-ecosystems (10 FTE's)*	167	$10,020,000	$10,264,000	$20,284,000
Enforcement	1] Enforce existing and new prohibitions against import/transport/sale/possession	*1] One enforcement officer per county*	4	$240,000		$240,000
Public Outreach	1] Internet-available invasive species information 2] Public understands hazards posed by invasive species	*1] Website manager for HEAR website 2] Public education/information specialists: 1 per county and 2 statewide 3] PSA's and publications @ $15K per county; statewide PSA's @ $100K*	7	$420,000	$160,000	$580,000
Totals			**386**	**$23,160,000**	**$11,471,000**	**$34,631,000**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

Need shown in this table represents overarching needs for invasive species management statewide (not including ungulates).

CGAPS "Box Exercise" Statewide Needs Matrix

Shared resource appear in *red itallics.* FTE's and associated costs are included in the Consolidated Needs table and are not shown here. Only costs and FTE's that are unique to this species are shown in the following table.

Species: Ungulates (feral pigs/goats/cattle, deer/m Category: Vertebrates

	Goals	Additional Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent all new feral/wild ungulate introductions to HI and interisland translocations	Create more effective regulation/policy/enforcement to restrict ungulate importation and translocation		$0		$0
Early Detection	Detect and map population densities on all islands	Annual aerial and ground surveys of forests, including 100 hrs helicopter time (BI: 4 FTE, each of other 5 islands: 2 FTE)	14	$840,000	$64,000	$904,000
Rapid Response	Respond to all populations in key native forests/watershed	Same as control below		$0		$0
Control	1] Control through fencing and removal in key native forests/watersheds statewide 2] Minimal damage visible in key native forests/watersheds 3] Moderate damage confined to Game Management Areas (GMA)	1] Control crews (BI: 45 FTE, MA: 25 FTE, OA: 20 FTE, K: 15 FTE, MO: 10 FTE [less existing FTE]) 2] Kennel of hunting dogs (BI: 40 dogs, each of other 5 islands: 20 dogs) ($140K) 3] 200 hrs helicopter time ($128K) 3] Fencing and fence maintenance ($2M) 4] Designation of new GMA's for recreational hunting and creation of new land classification for maximum protection 5] Research in immunocontraception and control methods ($200K)	115	$6,900,000	$2,468,000	$9,368,000
Enforcement	Enforce existing and new regulations on illegal importation/spread of feral ungulates	1] Enforce penalties for illegal transport and translocation (FTE???) 2] Create "no-bag-limit" policy for maximum protection areas 3] Confine axis deer on Maui to fenced hunting areas/deer farms		$0		$0
Public Outreach	Educate public on threats to watersheds/forests and need for fencing in watersheds and game management areas	*Develop and disseminate outreach materials stressing watershed/forest protection issues (4 FTE)*		$0		$0
Totals			**129**	**$7,740,000**	**$2,532,000**	**$10,272,000**

Assumptions:
FTE $ = projected at $60,000 per position to cover salary, fringe and support
Helicopter time = $640/hr
Pig dog maintenance cost = $377/dog (food & vet) + infrastructure = est. $1,000/dog

CGAPS "Box Exercise" Statewide Needs Matrix

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Species: Reptiles and Amphibians **Category: Vertebrates**

	Goals	Additional Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent import of most herp species 2] Prevent spread of species with limited distributions 3] prevent commercial sales of controlled species	*1] Enhance airport inspections including dog teams, X-ray and inspectors (80 FTE's) 2] Enhanced inspections at ports and harbors (60 FTE's) 3] improved system to intercept illegal mail and parcel shipment (amend federal regulations)* 4] State legislation prohibiting pet store sale of herps. 5] Screening system for herp imports. *6)"Greenseal" certification for all nurseries in compliance with BMP's (to be developed)*		$0		
Early Detection	1] Establish baseline distribution and abundance data for state 2] Establish network of trained volunteers to respond to sightings 3] Develop practical techniques for detection	*1]Establish identification and voucher system for herps 2] Establish statewide database 3] encourage public reporting through Invasives Hotline*		$0		
Rapid Response	Respond to all reported sightings of non-established species	*Rapid Response Team (2 FTE's per county)*		$0		
Control	1]Eradicate incipient populations where feasible 2] Conduct control research including biocontrol	*1] State authority to enter private lands to control/capture herps. 2] Enhance research on control methods including biocontrol 3] Rapid response team for control (see above)*		$0		
Enforcement	Enforce existing and new prohibitions against smuggling and possession	*1] Change state law and organizational capacity to make enforcement feasible 2]Improve cooperation between USFWS, USDA,state agencies and county law enforcement 3]One HDOA inspector per county (4 FTE's)*		$0		
Public Outreach	1] Educate public to hazards posed by herps. 2] Raise public awareness re. smuggling and possession of restricted species.	*1] Improve public recognition of herps as a problem (0.5 FTE per county)*		$0		
Totals			**0**	**$0**	**$0**	

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support

CGAPS "Box Exercise" Statewide Needs Matrix

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Species: Birds **Category: Vertebrates**

	Goals	Additional Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent establishment of new bird species in the state 2] prevent new island introductions of species already present on other islands within the state	1] In cooperation with pet industry and aviculturists, develop a voluntary "code of conduct" discouraging release of birds. 2] HDOA develop a science based screening system for bird imports to better exclude potentially damaging introductions ($60,000 contract) for three years.		$0	$60,000	$60,0
Early Detection	1]Detect new species to the state or new island introductions early enoudh to allow eradication. 2] Establish baseline data for populations and distributions of all established alien bird species in the state.	1] Establish procedures for positive identification of alien birds ($50,000 per year contract) *2] Develop a centralized database for all reports statewide*		$0	$50,000	$50,0
Rapid Response	Respond to all reports of wild-caught (or sighted) specimens of new species not currently established I the state. Identify species and potential impacts to agricultural and natural areas.	*Personnel are on-call to respond to all reports of new birds, as part of island ISC crew (2 FTE's per county)*		$0		
Control	1] Eradicate incipient populations. 2] Develop control techniques 3] Control localixed damage in ag and natural areas	1] Secure authority to enter private lands to control or capture reported illegal birds or known alien bird populations 2] Fund research to improve control methods($50,000 contract) *3] Establish a team in each county that can be used to eradicate incipient populations or priority taxa*		$0	$50,000	$50,0
Enforcement	Enforce existing prohibitions against release and ownership(as applicable)	*1] Change state law to make enforcement of current laws prohibiting possession and import feasible. 2] Change USFWS policy and regulation to allow better coordination with state agencies 3] One enforcement trained HDOA investigator per county 4] Expand authority and capacity for DLNR/DOCARE to assist HDOA. 5] Improved awareness and cooperation with county law enforcement*		$0		
Public Outreach	Public is aware of potential hazards that wild alien birds pose to Hawaiian species, health and agriculture. Develop a public climate that dose not tolerate release to the wild	*Public outreach and education effort focussed at increasing knowledge of problems associated with alien birds and that will reduce frequency of intentional releases by pet owners. (0.5 FTE per county)*		$0		
Totals			**0**	**$0**	**$160,000**	**$160,0**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

CGAPS "Box Exercise" Statewide Needs Matrix

Resources that can be shared with other efforts appear in *red italics*

Species: Ornamental Fishes **Category:**

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent all new introductions	1] DLNR/DOA have shared decision-making authority on import requests for aquatic species (0.5 FTE's for DAR) *2] Additional HDOA inspectors trained in fish and invertebrate indentification with authority and responsibility for checking outgoing shipments associated with home aquarium trade.*	0.5	$30,000		$30,0
Early Detection	1] Detect all new populations that become established in the wild through periodic surveys near ornamental fish aquaculture facilities.	1] Enhance communication between DAR personnel and scientific community to aid detection capacity *2] Outreach plan to encourage reporting by members of the public to a hotline number*		$0		
Rapid Response	1] Respond to all reports of unfamiliar fishes or invertebrates in the wild with identifications when possible and surveys when warranted.	Detection and response crews for fish with assistance of existing staff (2 additional FTE's and $100,000 operating budget)	2	$120,000	$100,000	$220,0
Control	1] Control and eradicate invasive species when possible, however it is accepted that control efforts once a species is established are usually ineffective 2] Strict requirements on aquaculture facilities that raise ornamentals	1] Rapid action for eradication based on a stepwise process of positive identification, assessment of risk, assesment of numbers and distribution, and development of control or eradication plan. This action would use current staff and ISC rapid response crews 2] Secure state authority to enter privaet lands to eradicate known alien populations in streams and reservoirs.		$0		
Enforcement	1] Enforce existing regulation on importation, transport, and release of alien species. 2] Establish a bonding system for ornamental aquaculture facilities to fund control measures in the event of escape.	1] Increase enforcement capability with DOA retaining primary enforcement responsibility for illegal importation/possession with assistance from DOCARE		$0		
Public Outreach	1] The public is aware of the environmental consequences of releasing alien aquatic species into the wild. 2] Establish and publicize a prorgram for the return of aquarium fish to be turned in to pet shops or the Humane Society in lieu of being released into the wild.	1] Public eductation campaign with PSA, posters and classroom presentations (material budget of $50,000 *2] information specialist time is part of the Consolidated Needs*		$0	$50,000	$50,0
Totals			**2.5**	**$150,000**	**$150,000**	**$300,0**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

CGAPS "Box Exercise" Statewide Needs Matrix

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Species: red piranha **Category: Vertebrate**

	Goals	Additional Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent most importations 2] Eliminate local breeding operations and commercial distribution	1] DLNR authority for permits to import aquatic species *2] DOA authority to inspect USPS packages with requirement that incoming packages from private sector receive HDOA approval including inspector staffing* 3] In cooperation with pet industry and aquarists, develop a voluntary "code of conduct" discouraging release of fish. 4] HDOA develop a science based screening system for fish imports to better exclude potentially damaging introductions ($60,000 contract for three years.)		$0	$60,000	$60,0
Early Detection	Detect all new populations	Detection efforts through current DAR field activities with close linkage to scientific community with increase reliance on reports from informed public		$0		
Rapid Response	Respond to all reports to confirm or deny presence	1] Prompt response and survey by DAR to all reports or piranha in the wild (0.5 FTE's with$50,000 operating budget2] Prompt DOA and DOCARE response (with search warrants, if needed) for reports of piranha in aquaria, tanks, or ponds on private premises	0.5	$30,000	$50,000	$80,0
Control	Control and eradicate through stepwise approach of confirmation, assesment of numbers and distribution, definition of population structure and reproduction, execute eradication based on information gathered, intensive public education	1] Follow the step-wise process if piranha are found in wild 2] Seize and destroy piranha found in private possesion 3] Authority to seize and destroy pirahna needs to be extended to DLNR, as well as DOA		$0		
Enforcement	Enforce existing regulations against import, possession, transport, sale and release	DOA should retain primary authority for illegal importation/possession with assistance from DOCARE. Follow through with prosecution of offenders and publicize results.		$0		
Public Outreach	1] Public is aware of consequences of releasing alien aquatic organisms into the wild 2] Establish amnesty program for the transfer of piranha to state authorities 3] Publicize process to turn aquarium fish in to pet shops or the Human Society instead of release to the wild.	*Information and education program that effectively warns the public about the hazards of importing and releasing alien aquatic species, with the piranha as a highlighted example. Outreach to be handled by FTE's included in combined needs section plut $50,000 operating budget for pirahna information.*		$0	$50,000	$50,0
Totals			**0.5**	**$30,000**	**$160,000**	**$190,0**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

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Species: Miconia calvescens **Category: Plants**

	Goals	Additional Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent all new Miconia spp. introductions into the state. 2]Prevent introduction of M. calvescens to Lanai and Molokai, 3] Prevent new plantings or movement of M. calvescens on infested islands	*1] Legislation/policy in place to screen new plant introductions into state,* 2] Legislation/policy to discourage import and possession of M. spp., 3] Policy to minimize role of human vectors and certification of "Miconia free" or treatment		$0		
Early Detection	1] Detect all new populations before flowering, 2] Detect all new Miconia spp. Statewide before flowering	*1]Hotline and GIS database for each County (1 FTE/county) , 2] Field and nursery surveys for all damaging invasive species (5 FTE's for BI, 2 for Oahu, 2 for Maui, 2 for Kauai), 3] Effective remote sensing methods, 4] Aerial surveys- 151 hours per year 5] Training and education (1FTE to maintain HEAR website.*		$0		
Rapid Response	Covered under Early Detection			$0		
Control	1] Eradicate on Kauai and Oahu 2] Prevent/eradicate on Molokai, Lanai, 3] Contain, control, reduce density and spread on Hawaii and Maui, 4] Develop and implement effective biocontrol statewide	*1] Rapid Response and Control teams in each county (31 FTE's statewide),* 2] Environmental assessment for entire state including all control measures (ground and aerial herbicide application) (1/4 FTE) *3] 20% of a new biocontrol facility with estimated cost of $10 million, plus 7 FTE's for quarantine staff and $100,000 per year for foreign exploration*	0.25	$15,000		$15,(
Enforcement	1] Effective regulations and enforcemnt to prevent inter-island movement, importation, and possession 2] Effective and appropriate staffing for HDOA enforcment	*1] 1 FTE per county for enforcment of existing and new regulations*		$0		
Public Outreach	1] Miconia as a known pest statewide. 2] Public knows the plant and ways to report. 3] Pathways, vectors, contamination of ag products are recognized in industry and mitigated. 4] Volunteer involvement	*1] 1FTE per county for education and outreach 2] funding for pamphlets, PSA, etc*		$0		
Totals			**0.25**	**$15,000**	**$0**	**$15,(**

Assumptions:
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Helicopter time= $640/hr

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Species: Fountain grass (Pennisetum setaceum) Category: Plant

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent establishment on Oahu, Maui, Molokai and Kauai 2] Prevent range extension on Hawaii 3] Stop futher introductions to state through seed trade	*1] One inspector for each of three shifts (24 hour coverage) at each port of entry to intercept fountain grass and other invasives in cargo or on vehicles and equipment (30 FTE's) 2] Authority to inspect incoming mail for illegal plants and seeds 3] Screen other grasses for invasiveness and ecological/economic risk and prohibit entry to state of those that pose unacceptable risk*		$0		
Early Detection	1] Detect all new infestations larger than 1 meter diameter using low-level helicopter flights, remote sensing and ground surveys 2] All survey and control information is recorded in a GIS database	*1] One statewide survey and mapping team (2 FTE's), plus 50 hours helicopter ($32,000) and remote sensing imagery (Estimated $10,000) for surveys on Oahu, Maui County, and Kauai 2] Surveys at Puuwaawaa, and Kahuku Ranch on Hawaii (FTE's included in "Control" below 3] Clearinghouse or hotline for reports from public (part of GIS database position below)*		$0		
Rapid Response	Response is adequate to eradicate all new satellite and isolated populations. Actions are taken to control dense core populations with emphasis on preventing spread.	*1] GIS position to maintain database and support control actions (1FTE) 2] Contract with Bishop Museum for voucher identification service (amount not specified)*		$0		
Control	1] Short term goal is same as for Rapid Response. Where fountain grass has been eradicated, favorable vegetation has been restored. 2] Long-term: biocontrol agents reduce fountain grass populations to levels that it does not pose significant ecological or economic harm	*1] Four-person rapid response team at each Puuwaawaa and Kahuku Ranch on the Big Island and for Maui County (12 FTE's) plus 100 hours helicopter 2] One two-person rapid response team each for Oahu and Kauai (4C2C10C20 FTE's) plus150 hours helicopter 3] One four-person rapid response team for each county (16 FTE's) plus 50 hours helicopter 4] One half FTE for biocontrol entomologist/pathologist plus $50,000 for foreign exploration and space in low-elevation quarantine facility*		$0		
Enforcement	Use and import of fountain grass (and other invasive grasses) for landscaping or other uses is prohibited in Hawaii	*One HDOA enforcment officer per county for enforcment and outreach*		$0		
Public Outreach	Public education on hazards posed by fountain grass, with emphasis on horticulturists, recreationists, gardeners, firemen, resource managers and landscape professionals	*One FTE per county for public awareness, education, media contacts, etc plus $15,000 per county for PSA's, pubs etc.*		$0	$60,000	$60,0
Totals			**0**	**$0**	**$60,000**	**$60,0**

Assumptions:
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Helicopter time= $640/hr

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Species: Senecio madagascariensis **Category: Plant**

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent spread and limit population to level that does not couse adverse economic or environmental impacts	Eliminate the weed in pasture areas (FTE's ????)		$0		
Early Detection	Detect and survey all new populations on all islands	Survey pastures for infestations (FTE's???)		$0		
Rapid Response	designate agency to be responsible for eradication/ control	1] HDOA to recommend action for conventional control/eradicaion for conventional methds (FTE's ???) 2] HDOA will release approved biologicl control agents (FTE's??? Facilities???)		$0		
Control	1] Eradicate on Oahu and Kauai using conventional means 2] prevent introductions on Lanai and Molokai 3] reduce populations levels and impacts on Hawaii and Maui using biocontrol	Livestock owners should keep grazing areas fireweed-free		$0		
Enforcement	regulations on importing seed as contaminant in seed shipments and hydromulch from contaminated areas.			$0		
Public Outreach	Educate the public with emphasis on cattle and horse owner re. Dangers of fireweed as poisonous to livestock	*Regular media information provided re. this toxic weed via TV, radio, newspapers, posters, meetings, etc.*		$0		
Totals			**0**	**$0**	**$0**	

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

CGAPS "Box Exercise" Statewide Needs Matrix

Resources that can be shared with other efforts appear in *red italics*

Species: Lethal yellowing **Category:**

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent establishment in Hawaii	1) Spot-check all freight destined to landscapers involved with turf establishment (9 FTE's under consolidated needs)		$0		
Early Detection	Detect and respond to any infestation			$0		
Rapid Response				$0		
Control				$0		
Enforcement				$0		
Public Outreach		Develop talks to landscape industry and signage/posters at ports of entry explaining why turf is prohibited.		$0	$50,000	$50,0
Totals			**0**	**$0**	**$50,000**	**$50,0**

Assumptions:
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Helicopter time= $640/hr

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Species: Banana bunchy-top disease **Category: Disease**

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent the movement of all banana plants between islands and foreign imports.	*1)Increase HDOA quarantine staff at all parts of entry including inter-island inspections (18 FTE's)*		$0		
Early Detection	Survey all banana plants on the islands periodically	*Increase HDOA Plant Pest Control Branch for banana surveys on all islands (3 FTE's)*	3	$180,000		$180,0
Rapid Response	Identify a lead agency and give them resources to do the job.	HDOA Plant Industry Division with staffing to lead all eradication efforts (staffing under "Control" below)		$0		
Control	1]Eradicate all banana plants on Oahu, to eliminate source of disease 2] eradicate all bananas in prescribed zones on other islands.	1] Hire temporary crews to do eradication work as needed with funds for herbicides and equipment (5 FTE's, $5000 for herbicides and equip)2] Helicopter monitoring of bananas in remote or inaccessible areas on Kauai (5 air hours)	5	$300,000	$37,000	$337,0
Enforcement	identify all current legislation that would support control activities.	Enforce and utilize Chapter 69-A, HRS 141-3.6- authority to enter private property for control and eradication.		$0		
Public Outreach	General public awarenesds of BBTV	Print and prepare BBTV info. via printed information, signage/posters at ports-of-entry, PSA's with emphasis on reaching passengers of inter-island flights.		$0	$150,000	$150,0
Totals			**8**	**$480,000**	**$187,000**	**$667,0**

Assumptions:
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Helicopter time= $640/hr

CGAPS "Box Exercise" Statewide Needs Matrix

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Species: Ballast water/ hull encrusting organisms Category: invertebrates (primarilly)

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent further introductions through ballast water	1] Adequately fund DLNR to address ballast water management responsibilities, including 6 FTE's for inspection, enforcement and support 2] Institute appropriate "docking fee" for each interational ship entering a Hawaiian port to pay for ballast water management program 3] State law requiring ballast water exchange beyong 12 miles before entering Hawaiian waters	6	$360,000		$360,0
Early Detection	1] Detect vessels representing special risk and ensure ballast water exchange before entry to Hawaiian waters and hull examinations as warranted 2] Detect irruptions of alien aquatic species promptly 3] Periodically survey areas of high risk for new introductions	1] Develop a system to screen for high-risk vessels and inspect as needed, using staff described above 2] Lab facilities and methods to test ballast water for potential disease or red tide orgnisms ($200,000)		$0	$200,000	$200,0
Rapid Response	Promptly respond to reports of high risk vessels making inspections and taking appropriate actions, including biological surveys of the immediate area where high risk vessels are moored.	Staffing is described above with an operating budget of $250,000		$0	$250,000	$250,0
Control	Control and eradicate threatening organisms in ballast water or on the hull of incoming vessels. Eradicate any alien organisms that escape	Staffing, equipment and policy- not specified		$0		
Enforcement	Encourage Coast Guard to enforce existing regulations for ballarably before ships reach vulnerable waters 2] Need better regulations for vessels entering Hawaiian waters	Inspection and enforcement to be carried out by staff described above (not out sourced to DOCARE, due to specialized nature)		$0		
Public Outreach	An informed public willing to induce legislators and policy makers to commit sufficient fungint for a bllast water control program	One FTE with a $50,000 operating budget to target shipping companies and vessel owners.	1	$60,000	$50,000	$110,0
Totals			**7**	**$420,000**	**$500,000**	**$920,0**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

Shared resource appear in *red itallics.* FTE's and associated costs are included in the Consolidated Needs table and are not shown here. Only costs and FTE's that are unique to this species are shown in the following table.

Resources that can be shared with other efforts appear in *red italics*

Species: Marine alga (Kappaphycus complex) and Category: plants

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent introductions of new species. 2) prevent translocation of species with establish local populations 3)Prevent sale of Kappaphycus	Increase expertise within DAR by adding one algal/aquatic plant specialist and one technical aide	2	$120,000		$120,0
Early Detection	Detect all new introductions and range expansion of established species.	Develop a baseline distribution database using DAR staffing plus the two positions described above.		$0		
Rapid Response	respond to all new populations or range expansions	Assess status of known populations with staff described above.		$0		
Control	1] Contain or eradicate localized populations 2] Monitor treated areas to prevent re-establishment	Use staff described above working with volunteers to control localized irruptions in fresh waters. Funding is for materials and supplies.		$0	$100,000	$100,0
Enforcement	Enforce and strengthen regulations on importation, transport, sale, release and inter-island transportation	Need legal authority to bar the collection and sale of Kappaphycus. Increase enforcment priorities to contain known populations		$0		
Public Outreach	Public is aware of potential harm caused by marine algae and aquatic plants,	One information specialist for DAR I&E to increase public awareness and to organize community action for control and eradication.	1	$60,000		$60,0
Totals			**3**	**$180,000**	**$100,000**	**$280,0**

Assumptions:
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Helicopter time= $640/hr

CGAPS "Box Exercise" Statewide Needs Matrix

Shared resource appear in *red itallics.* FTE's and associated costs are included in the Consolidated Needs table and are not shown here. Only costs and FTE's that are unique to this species are shown in the following table.

Species: Asian Long Horn Beetle (*Anoplophora gla* Category: Invertebrates

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent all introductions	Legislation prohibiting use of solid wood packing or requiring only treated lumber for imports		$0		
Early Detection	Detect all incoming insects before off loading goods.	1] Inspection of all imports that are shipped with solid wood packing (FTE's) 2] surveys of potentially infested areas (FTE's)		$0		
Rapid Response	Respond quickly to any new detections	Inspections of all offloading of imports (FTE's)		$0		
Control	Return infested shipments to country of origin	*1] Inspection crews at maritime and air cargo offloading sites (FTE's ???) 2] survey crews (FTE to be determined???)*		$0		
Enforcement	1] Existing regulations on treatment of solid wood packing 2] Establish appropriate penaltie for those not complying with exixting regulations.	Enforce appropriate fines for insects found in solid wood packing or improperly treated packing (FTE's???)		$0		
Public Outreach	Public understands the risks associated with ALB and knows how to report sightings	Distibutution of ALB information through PSA's and printed materials (FTE's???)		$0		
Totals			**0**	**$0**	**$0**	

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

CGAPS "Box Exercise" Statewide Needs Matrix

Shared resource appear in *red itallics.* FTE's and associated costs are included in the Consolidated Needs table and are not shown here. Only costs and FTE's that are unique to this species are shown in the following table.

Species: Yellow-fever mosquito (Aedes aegypti) Category: Invertebrate

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent interisland movement of A.a.	*Improve inspection/treatment of cargo/goods (6 FTE)*		$0		
Early Detection	Detect all new establishment of A.a.	Improve surveillance effort statewide (4 FTE)	4	$240,000		$240,0
Rapid Response	Respond to all newly discovered populations	Control team (FTE: same as above)	0	$0		
Control	Treat all breeding containers	1] Larval habitat source reduction in residential, industrial and agricultural areas (FTE???) 2] Larvicide and sterile male treatments for emergency situations (FTE???)		$0		
Enforcement	Enforce mosquito vector control regulations	Enforce landowner compliance with vector control regulations (5 FTE)	5	$300,000		$300,0
Public Outreach	Make public aware of mosquitos as disease vectors and prevention methods	*Develop and disseminate outreach materials (1 FTE)*		$0		
Totals			**9**	**$540,000**	**$0**	**$540,0**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support

CGAPS "Box Exercise" Statewide Needs Matrix

Shared resource appear in *red itallics.* FTE's and associated costs are included in the Consolidated Needs table and are not shown here. Only costs and FTE's that are unique to this species are shown in the following table.

Species: Mosquitos (Anopheles spp.) **Category: Invertebrate**

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent all introductions of Anopheles	*Improve inspection/treatment of cargo/goods (6 FTE)*		$0		
Early Detection	Detect and identify all breeding sites	Improve surveillance effort statewide (4 FTE)	4	$240,000		$240,0
Rapid Response	Respond immediately to all new reported populations	Control team (FTE: same as above)	0	$0		
Control	Control all breeding sites by immediate spraying	Larvicide treatment for all breeding sites (FTE???)		$0		
Enforcement	Enforce all mosquito vector control regulations	Enforce landowner compliance with vector control regulations (5 FTE)	5	$300,000		$300,0
Public Outreach	Make public aware of mosquitos as disease vectors and prevention methods	*Develop and disseminate outreach materials (1 FTE)*		$0		
Totals			**9**	**$540,000**	**$0**	**$540,0**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support

CGAPS "Box Exercise" Statewide Needs Matrix

Shared resource appear in *red itallics.* FTE's and associated costs are included in the Consolidated Needs table and are not shown here. Only costs and FTE's that are unique to this species are shown in the following table.

Species: Ants (Formicidae) **Category: Invertebrates**

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	1] Prevent all new ant introductions to the State 2] Prevent inter-island movement of species with restricted distributions within the state	1] better knowledge/analysis of pathways of introduction ($60000 contract for one year) 2] better knowledge of current species and distribution in state (see under early detection) 3] Federal policy of "no ants allowed" on goods or persons entering Hawaii 4] federal quarantine protection of Hawaii with all Formicidae on PPQ list for goods/persons entering Hawaii *5] HDOA authority to inspect non-ag commodities 6] state inspection of first class mail 7] Inspection teams at all ports-of-entry with dogs and best available technology* 8] regulations requiring use of latest ant retarding technlogies for packaging/transporting and treating goods entering the state from RIFA infested areas 9]stringent penalties for vilolations.	0.5	$30,000	$60,000	$90,(
Early Detection	1] Detect all arrivals of new species to the state 2] Detect all new arrivals to individual islands	1] 3 additional survey entomologists to conduct ant surveys *2] knowledgeable public*	3	$180,000		$180,(
Rapid Response	Respond to all new species introductions	*1] As needed assistance from island ISC crews to assist with surveys and control efforts under direction of HDOA* 2] Designation of "highest priority" for control for species designated by the Hawaii Ant Group. 3] State and federal permits for use of necessary pesticides in advance of actual need ($200,000 contract) 4] Quarantine/containment contingency plans in place in advance of need 5] Pesticides, equipment and certifications ready in advance of need		$0	$200,000	$200,(
Control	Eradicate all new species introductions, with "highest priority" designation given to those species assessed by the Hawaii Ant Group to be most serious threat (weaver ants, little fire ant, etc.)	1] Authority to access and treat private lands under emergency measures for priority speicies identified by Hawaii Ant Group 2] Emergency funds pre-approved for rapid response actions		$0		
Enforcement	Enforce all regulations concerning quarantine/inspection/transport	*1] strict enforcement of import/quarantine/ant regulations 2] stiff penalties for violations*		$0		
Public Outreach	Public has good knowledge of ants, their non-native status and potential impacts. There is an ongoing program to educate	*1] "ants as invaders" as part of Hawaii science curricullum 2] PSA's and printed materials available to public 3] Educational material to Hawaii physicians re: ant bite diagnosis and information to collect.*		$0		
Totals			**3.5**	**$210,000**	**$260,000**	**$470,(

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support
Helicopter time= $640/hr

CGAPS "Box Exercise" Statewide Needs Matrix

Shared resource appear in *red itallics.* FTE's and associated costs are included in the Consolidated Needs table and are not shown here. Only costs and FTE's that are unique to this species are shown in the following table.

Species: Red Imported Fire Ant (Solenopsis invicta Category: Invertebrate

	Goals	Capacity	#FTE's	FTE $	Funding	Subtotal
Prevention	Prevent establishment on all islands	1] Improve knowledge of pathways *2] State law giving HDOA authority to inspect non-ag. items* 3] "No ants allowed" policy for goods/persons entering HI *4] Federal domestic quarantine law and USDA inspection/protection assistance 5] State inspection of first class mail from mainland 6] Special exemption for preemption clause in Fed quarantine regs 7] Inspectors with dogs at all ports of entry* 8] Regulations requiring special handling of goods from RIFA-infested areas *9] Stringent penalties for violations of import/quarantine regulations 10] "Greenseal" certification for all nurseries in compliance with BMP's (to be developed)*	0.5	$30,000		$30,0
Early Detection	Detect all new arrivals promptly	*1] HDOA inspection for RIFA of all certified nurseries with proven detection technology at time of inspection (6 FTE) 2] Survey high risk areas using proven technology (3 FTE)*		$0		
Rapid Response	Respond to all introductions immediately	1] Designation of RIFA as highest priority for field crews, if/when detected 2] State/Fed permits secured for pesticide use prior to need (see Formicidae sheet) 3] Quarantine/containment policies established prior to need	0	$0		
Control	Eradicate all introductions immediately	1] HDOA emergency authority to access/treat land without owner permission 2] Emergency funds available for eradication		$0		
Enforcement	Enforce all laws/regulations re: quarantine/inspection/transport of goods	*1] Strict enforcement of all import/quarantine regulations 2] Stiff penalties for violations*		$0		
Public Outreach	Public is aware of RIFA and reporting procedures for sightings	*1] Information pamphlet to all licensed physicians re: RIFA stings 2] Develop and disseminate outreach material (4 FTE)*	0	$0		
Totals			**0.5**	**$30,000**	**$0**	**$30,0**

Assumptions:
FTE $= projected at $60,000 per position to cover salary, fringe and support h
Helicopter time= $640/hr